

WHAT IS CLAIMED IS:

- 1           1.    A computer system using a queuing system for
- 2   managing a queue, said queuing system comprising:
- 3           a plurality of generic queue headers;
- 4           a plurality of links for connecting the generic queue
- 5   headers in a predetermined manner;
- 6           a plurality of data structures, each data structure
- 7   attached to one of the generic queue headers; and
- 8           a plurality of queue function calls for controlling
- 9   operations of the plurality of generic queue headers.

1           2.    The queuing system of Claim 1, wherein each  
2   generic queue header includes a pointer to a next generic  
3   queue header, a pointer to a previous generic queue  
4   header, and a pointer to the attached data structure.

1           3.    The queuing system of Claim 2, wherein each  
2   generic queue header includes a dynamic queue header.

1           4.    The queuing system of Claim 2, wherein each  
2   generic queue header includes a static queue header.

1           5.    The queuing system of Claim 1, wherein the  
2   plurality of queue function calls includes operations such  
3   as insert, remove, search and remove, search and insert,  
4   search only and peek.

1           6.    The queuing system of Claim 1, wherein each link  
2   connecting a pair of the generic queue headers is uni-  
3   directional.

1           7.    The queuing system of Claim 1, wherein each link  
2    connecting a pair of the generic queue headers is bi-  
3    directional.

1           8.    The queuing system of Claim 1, wherein each data  
2    structure includes a search key field, and one of the  
3    generic queue function calls utilizes a search command to  
4    scan each data structure attached to one of the generic  
5    queue headers until the search command matches the search  
6    key field and the operation of the one of the queue  
7    function calls is performed.

1           9.    The queuing system of Claim 1, wherein said  
2    queuing system is used in an operating system or driver.

1           10. A queuing system used in an intelligent I<sub>2</sub>O  
2 driver of a computer system for managing a queue, said  
3 queuing system comprising:

4           a plurality of queue headers;

5           a plurality of links for connecting the queue headers  
6 in a predetermined manner;

7           a plurality of data structures, each data structure  
8 attached to one of the queue headers; and

9           a plurality of queue action function calls for  
10 controlling operations of the plurality of queue headers.

1           11. The queuing system of Claim 10, wherein each  
2           queue header includes a pointer to a next queue header, a  
3           pointer to a previous queue header and a pointer to the  
4           attached data structure.

1           12. The queuing system of Claim 11, wherein each  
2           queue header includes a dynamic queue header.

1           13. The queuing system of Claim 11, wherein each  
2           queue header includes a static queue header.

1           14. The queuing system of Claim 10, wherein the  
2           plurality of queue action function calls includes  
3           operations such as insert, remove, search and remove,  
4           search and insert, search only and peek.

1           15. The queuing system of Claim 10, wherein each  
2           link connecting a pair of the queue headers is uni-  
3           directional.

1           16. The queuing system of Claim 10, wherein each  
2 link connecting a pair of the queue headers is bi-  
3 directional.

1           17. The queuing system of Claim 10, wherein each  
2 data structure includes a search key field, and one of the  
3 queue action function calls utilizes a search command to  
4 scan each data structure attached to one of the queue  
5 headers until the search command matches the search key  
6 field and the operation of the one of the queue function  
7 calls is performed.

1           18. A method for managing a queue having a plurality  
2 of queue headers within a computer system comprising the  
3 steps of:

4           attaching a plurality of data structures to the  
5 plurality of queue headers, where each data structure is  
6 attached to one of the plurality of queue headers; and

7           controlling operations of the plurality of queue  
8 headers utilizing one of a plurality of queue function  
9 calls.

1           19. The method of Claim 18, wherein the step of  
2           attaching includes the following steps:

3           configuring each data structure for a specific  
4           transaction; and

5           allocating each configured data structure to one of  
6           the queue headers including a dynamic queue header.

1           20. The method of Claim 18, wherein the step of  
2           controlling includes inserting an additional data  
3           structure onto one of the plurality of queue headers.

1           21. The method of Claim 19, wherein the step of  
2           controlling includes removing one of the attached data  
3           structures from one of the plurality of queue headers.

1           22. The method of Claim 18, wherein the step of  
2           controlling includes searching the attached data  
3           structures having a search key field using a search  
4           command and removing the searched data structure  
5           satisfying the search command.



1           23. The method of Claim 18, wherein the step of  
2     controlling includes searching the attached data  
3     structures having a search key field using a search  
4     command and inserting an additional data structure onto  
5     one of the plurality of queue headers.

1           24. The method of Claim 18, wherein the step of  
2     controlling includes peeking in a predetermined order at  
3     the attached data structures.

1           25. The method of Claim 18, wherein the step of  
2     controlling includes searching the attached data  
3     structures having a search key field using a search  
4     command and reporting a location of the attached data  
5     structure satisfying the search command.